PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of

Miki ARITA et al.

Serial No.: New Application

Filed: May 30, 2001

For: MOTION VECTOR DETECTION APPARATUS

PRELIMINARY AMENDMENT

Commissioner for Patents
Washington, D.C. 20231

Sir:

Prior to examination of the above-identified application, please enter the following specification changes as noted below:

IN THE CLAIMS:

Please amend claims 8-10, 13, 14, 16, 22, 30-32, 36, and 42 as follows:

8. (Amended) A motion vector detection apparatus as defined in Claim 1, wherein said motion vector detector is an integer precision motion vector detector that detects an integer precision motion vector from the data outputted from the first storage unit and the data outputted from the second storage unit.

9. (Amended) A motion vector detection apparatus as defined in Claim 1, wherein said motion vector detector comprises:

an interpolation pixel generator for receiving the data outputted from the first storage unit, and generating decimal precision pixel data; and

a decimal precision motion vector detector for detecting a decimal precision motion vector from the data outputted from the interpolation pixel generator and the data outputted from the second storage unit.

10. (Amended) A motion vector detection apparatus as defined in Claim 1, wherein said motion vector detector comprises:

an integer precision motion vector detector that detects an integer precision motion vector from the data outputted from the first storage unit and the data outputted from the second storage unit;

an interpolation pixel generator for receiving the data outputted from the first storage unit, and generating decimal precision pixel data; and

a decimal precision motion vector detector for detecting a decimal precision motion vector from the data outputted from the interpolation pixel generator and the data outputted from the second storage unit.

13. (Amended) A motion vector detection apparatus as defined in Claim 11, wherein said interpolation pixel generator comprises:

a shift register unit comprising at least two shift registers; and

an interpolation unit performing interpolation using pixel data stored in the shift register unit.

14. (Amended) A motion vector detection apparatus as defined in Claim 11, wherein said interpolation pixel generator comprises:

a shift register unit comprising, at least, (the number of pixels to be read out in a specific direction + 2) pieces of shift registers; and

an interpolation unit performing interpolation using pixel data stored in the shift register unit.

16. (Amended) A motion vector detection apparatus as defined in Claim 11 further comprising an integer precision motion vector detector for detecting an integer precision motion vector from the data outputted from the first storage unit and the data outputted from the second storage unit.

22. (Amended) A motion vector detection apparatus as defined in Claim 20 further comprising:

an interpolation pixel generator for receiving the data outputted from the first storage unit, and generating decimal precision pixel data; and

a decimal precision motion vector detector for detecting a decimal precision motion vector from the data outputted from the

interpolation pixel generator and the data outputted from the second storage unit.

30. (Amended) A motion vector detection method as defined in Claim 23, wherein said motion vector detection step is an integer precision motion vector detection step of detecting an integer precision motion vector by using the reference area data and the target block data.

31. (Amended) A motion vector detection method as defined in Claim 23, wherein said motion vector detection step comprises:

an interpolation pixel generation step of receiving the pixel data constituting the reference area data, and generating decimal precision pixel data; and

a decimal precision motion vector detection step of detecting a decimal precision motion vector, using the data outputted from the interpolation pixel generation step, and the target block data.

32. (Amended) A motion vector detection method as defined in Claim 23, wherein said motion vector detection step comprises:

an integer precision motion vector detection step of detecting an integer precision motion vector, using the reference area data and the target block data;

an interpolation pixel generation step of receiving the pixel data constituting the reference area data, and generating decimal precision pixel data; and

a decimal precision motion vector detection step of detecting a decimal precision motion vector, using the data outputted from the interpolation pixel generation step, and the target block data.

36. (Amended) A motion vector detection method as defined in Claim 33 further comprising an integer precision motion vector detection step of detecting an integer precision motion vector, using the reference area data and the target block data.

42. (Amended) A motion vector detection method as defined in Claim 40 further comprising:

an interpolation pixel generation step of receiving the pixel data constituting the reference area data, and generating decimal precision pixel data; and

a decimal precision motion vector detection step of detecting a decimal precision motion vector, using the data outputted from the interpolation pixel generation step, and the target block data.

REMARKS

Claims 1-42 remain pending herein. Claims 8-10, 13, 14, 16, 22, 30-32, 36, and 42 have been amended hereby.

This Preliminary Amendment is submitted to eliminate multiply dependent claims from the above-identified application.

Examination of this application on its merits is respectfully requested.

Respectfully submitted,

PARKHURST & WENDEL, L.L.P.

May 30, 2001
Date

[signature]
Roger W. Parkhurst
Registration No. 25,177

RWP/mhs

Attorney Docket No. HYAE:118

Attachment: Claim Mark-ups

PARKHURST & WENDEL, L.L.P.
1421 Prince Street, Suite 210
Alexandria, Virginia 22314-2805
Telephone: (703) 739-0220

CLAIM MARK-UPS FOR
NEW APPLICATION FILED MAY 30, 2001
ENTITLED "MOTION VECTOR DETECTION APPARATUS"
ATTORNEY DOCKET NO.: HYAE:118

8. (Amended) A motion vector detection apparatus as defined in Claim 1 [any of Claims 1 to 7], wherein said motion vector detector is an integer precision motion vector detector that detects an integer precision motion vector from the data outputted from the first storage unit and the data outputted from the second storage unit.

9. (Amended) A motion vector detection apparatus as defined in Claim 1 [any of Claims 1 to 7], wherein said motion vector detector comprises:

an interpolation pixel generator for receiving the data outputted from the first storage unit, and generating decimal precision pixel data; and

a decimal precision motion vector detector for detecting a decimal precision motion vector from the data outputted from the interpolation pixel generator and the data outputted from the second storage unit.

10. (Amended) A motion vector detection apparatus as defined in Claim 1 [any of Claims 1 to 7], wherein said motion vector detector comprises:

an integer precision motion vector detector that detects an integer precision motion vector from the data outputted from the first storage unit and the data outputted from the second storage unit;

an interpolation pixel generator for receiving the data outputted from the first storage unit, and generating decimal precision pixel data; and

a decimal precision motion vector detector for detecting a decimal precision motion vector from the data outputted from the interpolation pixel generator and the data outputted from the second storage unit.

13. (Amended) A motion vector detection apparatus as defined in Claim 11 [or 12], wherein said interpolation pixel generator comprises:

a shift register unit comprising at least two shift registers; and

an interpolation unit performing interpolation using pixel data stored in the shift register unit.

14. (Amended) A motion vector detection apparatus as defined in Claim 11 [or 12], wherein said interpolation pixel generator comprises:

a shift register unit comprising, at least, (the number of pixels to be read out in a specific direction + 2) pieces of shift registers; and

an interpolation unit performing interpolation using pixel data stored in the shift register unit.

16. (Amended) A motion vector detection apparatus as defined in Claim 11 [any of Claims 11 to 15] further comprising an integer precision motion vector detector for detecting an integer precision motion vector from the data outputted from the first storage unit and the data outputted from the second storage unit.

22. (Amended) A motion vector detection apparatus as defined in Claim 20 [or 21] further comprising:

an interpolation pixel generator for receiving the data outputted from the first storage unit, and generating decimal precision pixel data; and

a decimal precision motion vector detector for detecting a decimal precision motion vector from the data outputted from the interpolation pixel generator and the data outputted from the second storage unit.

30. (Amended) A motion vector detection method as defined in Claim 23 [any of Claims 23 to 29], wherein said motion vector detection step is an integer precision motion vector detection step of detecting an integer precision motion vector by using the reference area data and the target block data.

31. (Amended) A motion vector detection method as defined in Claim 23 [any of Claims 23 to 29], wherein said motion vector detection step comprises:

an interpolation pixel generation step of receiving the pixel data constituting the reference area data, and generating decimal precision pixel data; and

a decimal precision motion vector detection step of detecting a decimal precision motion vector, using the data outputted from the interpolation pixel generation step, and the target block data.

32. (Amended) A motion vector detection method as defined in Claim 23 [any of Claims 23 to 29], wherein said motion vector detection step comprises:

an integer precision motion vector detection step of detecting an integer precision motion vector, using the reference area data and the target block data;

an interpolation pixel generation step of receiving the pixel data constituting the reference area data, and generating decimal precision pixel data; and

a decimal precision motion vector detection step of detecting a decimal precision motion vector, using the data outputted from the interpolation pixel generation step, and the target block data.

36. (Amended) A motion vector detection method as defined in Claim 33 [any of Claims 33 to 35] further comprising an integer

precision motion vector detection step of detecting an integer precision motion vector, using the reference area data and the target block data.

42. (Amended) A motion vector detection method as defined in Claim 40 [or 41] further comprising:

an interpolation pixel generation step of receiving the pixel data constituting the reference area data, and generating decimal precision pixel data; and

a decimal precision motion vector detection step of detecting a decimal precision motion vector, using the data outputted from the interpolation pixel generation step, and the target block data.